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## Pesticides and your health — a family physician's perspective

*By Cathy Vakil, MD*

While it's still winter in most parts of Canada, it won't be long before our kids are rolling around in parks and front lawns on hot summer days. Avid gardeners are already starting seedlings indoors and lawn care companies are calling to set up summer appointments.

Meanwhile, [British Columbia](#) and [Nova Scotia](#) are considering potential bans on lawn and garden pesticides. "Cosmetic" pesticides are already prohibited in [Quebec](#) and [Ontario](#) and new restrictions will be in effect this summer in [New Brunswick](#) and PEI, too.

Ultimately, the controversy surrounding pesticide use comes down to health — if these chemicals are harmful, they should be banned; if they are safe they can be used widely and freely without restriction. However, determining whether a chemical is harmful or not is not always easy or straightforward. The studies that can be done on pesticides are mostly population studies looking at whether people with increased exposure to multiple pesticides develop illnesses more than the average. The studies have some limitations, and cannot always draw unequivocal conclusions.

In 2004, I co-authored a [scientific review](#) of published research examining the human health effects of pesticides for the [Ontario College of Family Physicians](#). We searched commonly used medical databases and reviewed 265 studies on cancer, and neurological, dermatological, reproductive and immunological/genotoxic disorders that met our strict criteria for methodological quality.

Unfortunately most studies examined occupational exposure of only adult males, with a paucity of studies looking at women and children. Yet the few studies available suggested that pregnant women and children are particularly vulnerable. My colleagues and I concluded that there was enough evidence of the harmful effects of these chemicals that doctors should advise their patients to avoid all possible exposure. Here's a look at what we found.

There were 104 studies looking at a number of different cancers. Most of these found a link between pesticide exposure and cancer, many of them reaching statistical significance (meaning the associations found were unlikely to be by chance). Increases in Non-Hodgkin lymphoma were found in farmers, pesticide production workers and golf course superintendents, and one study in children found elevated rates of the cancer when pesticides were used in the home and when parents had occupational exposure.

One study found an increase in childhood leukemia with home exposure and prenatal exposure to pesticides. In this study children with a "poor metabolizer" genetic mutation increased the risk of leukemia with exposure to pesticides,

indicating a possible genetic predisposition. Other studies showed that exposure to pesticides in early childhood, prenatally and even pre-conception may increase risk of leukemia.

All the studies on brain and kidney cancer showed increased risk with pesticide exposure even in the children of exposed workers. One study found a decreased risk of breast cancer in farming women, though risk was elevated for those women who reported being in the field during or shortly after pesticide application, as well as for those who reported not using protective clothing.

All eight papers on prostate cancer showed elevated incidence in workers who were exposed to pesticides, with one showing higher rates in exposed workers with a family history of prostate cancer.

Skin is the primary route of exposure to pesticides for workers. A few high-quality studies showed increases in rashes in agricultural labourers and pet groomers.

Thirty-nine of 41 studies on neurotoxicity found an association between pesticide exposure and one or more neurologic abnormalities such as mild cognitive dysfunction, neurobehavioural changes, depression, and even suicide. Only two studies examined children, finding significant neurodevelopmental effects in preschool children with pervasive agricultural exposure in Mexico. Previous pesticide poisonings were found to be related to impaired neurobehavioural function, and 15 out of 26 studies found associations between pesticide exposure and Parkinson's disease.

Fifteen studies from nine countries found increases in birth defects (limb, urogenital, central nervous system, orofacial and heart anomalies) with pesticide exposure of the mother. Results of the studies on fertility were mixed but several did find reduced fertility, sperm abnormalities and erectile dysfunction with increased pesticide exposure. Some studies showed that preconception and prenatal exposure to pesticides may increase low birth weight, prematurity, stillbirth, miscarriage and neonatal death.

Chromosome aberrations (genetic damage to cells which could present as miscarriage, birth defects, sperm abnormalities or cancer) were found in 11 of 14 studies, though other factors such as smoking, radiation, diet and alcohol consumption were not always accounted for.

Overall, this review on the health effects of pesticides provides clear evidence that pesticide exposure increases risk to human health. As a doctor, it's my role as health advocate to advise my patients to reduce exposure to all pesticides whenever possible, and to promote the passage of legislation banning non-essential pesticide use and sale. This would protect especially vulnerable populations such as women and men considering pregnancy, pregnant women, infants and children.

*Cathy Vakil is a family doctor at the Department of Family Medicine at Queen's University in Kingston, Ontario and has an interest in health and the environment. She is on the Environmental Health Committee of the Ontario College of Family Physicians and the Board of Directors of Canadian Association of Physicians for the Environment (CAPE). Her interests include the health effects of pesticides, urban sprawl, climate change, air pollution and nuclear energy.*

February 25, 2010

<http://www.davidsuzuki.org/blogs/docs-talk/2010/02/pesticides-and-your-health---a-family-physicians-perspective/>